

A Juvenile Gempylid Fish, *Nealotus tripes*, from Eastern Australia

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ABSTRACT

The gempylid fish *Nealotus tripes* Johnson is newly recorded from eastern Australia, based on one juvenile specimen 49.8 mm standard length taken off Sydney. The juvenile has relatively larger, serrated fin spines than 24 larger specimens from Lord Howe Island. The species is also known from Papua-New Guinea, on the basis of a single specimen previously identified as *Promethichthys prometheus*.

INTRODUCTION

The fishes of the family Gempylidae are widely distributed in tropical and temperate waters of both the Atlantic and Indo-Pacific Oceans. The family consists of 14 genera and 15 species (Parin and Bekker, 1972) considered to be predaceous and mostly inhabiting deep waters. However, the systematics of the family is not understood comprehensively. There is also a paucity of life history information on these fishes.

Around Australia very few species of gempylid fishes have been recorded. Munro (1958a) reported only four species in his "Handbook of Australian fishes", *Leionura atun* (= *Thyrsites atun*), *Rexea solandri*, *Lepidocybium flavobrunneum* and *Ruvettus tydemani* (= *Ruvettus pretiosus*). Of these, both *Thyrsites atun* and *Rexea solandri* are important commercially. The other two are rather rare. Five more species, which are all uncommon, are recognised around Australia (Nakamura, unpublished data; Parin and Bekker, 1972). They are *Epinnula orientalis*, *Gempylus serpens*, *Rexea prometheoides*, *Nealotus tripes* and *Promethichthys prometheus*.

Nealotus tripes Johnson, a cosmopolitan species, has been recorded from Lord Howe Island (Ogilby, 1899; Allen *et al.*, 1976) and off north western Australia (Parin and Bekker, 1972). Recently, a juvenile specimen of the species was obtained off Sydney by F. R. V. Kapala, and is a new record of occurrence from the waters of the east Australian continental shelf. This paper compares the juvenile specimen with the specimens collected from Lord Howe Island and deposited in The Australian Museum (AMS, 23 specimens) and the Queensland Museum (QM, 1 specimen, Ogilby's type of *Machaerope latispinus*).

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MATERIALS AND METHODS

A juvenile specimen of *Nealotus tripes* (AMS I. 17887-006, 49.8 mm standard length) on which this description is based, was obtained from off Sydney, N.S.W. (34°13'S, 150°22'E) in a midwater trawl fishing from 0-145 m over a bottom of 165 m on May 6, 1974 by F. R. V. Kapala of New South Wales Fisheries. Twenty-four specimens collected from the beach at Lord Howe Island were used for the comparison (AMS IA. 1398-1404, I. 4121-4123, I.4312, I.5189, I.5590-5595, I.5597, I.5598, I.7858, I.7859, I.10700; 130.5-236.1 mm in standard length and QM 11/74 137.5 mm in standard length). The methods of measurement follow Hubbs and Lagler (1949). The drawings were made with the aid of a binocular microscope and vertebral counts from X-rays.

DESCRIPTION OF THE JUVENILE

Counts, measurements and description of the juvenile specimen (1) are followed by those of the Lord Howe Island specimens (24) in parentheses. Dorsal fin rays XX, I, 18+2 (XIX-XXI, I, 16-19+2); anal rays II, 16+2 (II, 15-19+2); pectoral rays 14 (12-14); pelvic rays I,1(I,1); gill-rakers on first arch 5+1+11 (5-8+1+10-17); branchiostegals 7 (7); intramuscular bones — (31-34); vertebrae including urostyle 37 (20+17=37 or 21+16=37); pyloric caeca — (8).

The following measurements are expressed as percent standard length: head length 28.1 (25.6-28.3); snout to insertion of first dorsal 24.7 (24.0-26.4); snout to insertion of second dorsal 75.7 (73.1-75.9); snout to insertion of pectoral 26.7 (26.3-28.5); snout to insertion of pelvic 26.3 (27.3-31.4); snout to anus 72.5 (67.2-71.7); snout to insertion of anal 73.4 (66.9-76.2). The following measurements are expressed as percent of head length: body depth 41.4 (43.0-56.2); body width 17.9 (12.0-31.2); snout length 35.0 (36.2-42.9); upper jaw length 42.0 (43.6-48.2); orbit length 25.0 (19.4-23.4); interorbital width 15.0 (17.1-20.6); pectoral fin length 43.6 (37.9-60.5); pelvic spine length 37.1 (7.8-15.9); length of longest first dorsal ray (spine) 30.7 (27.7-33.3); length of longest second dorsal ray (soft ray) 31.5 (25.8-34.0); length of first

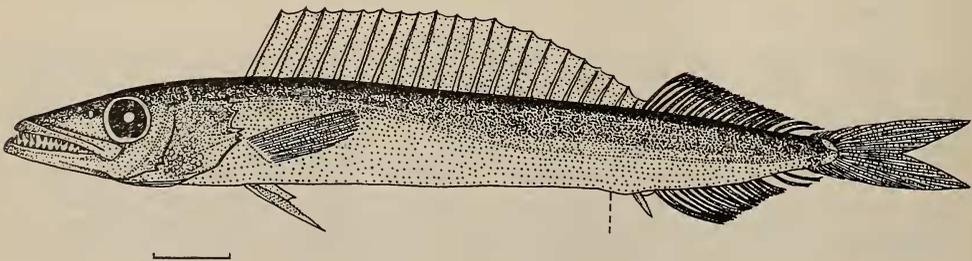


Fig. 1. Juvenile of *Nealotus tripes* (AMS I. 17887-006) obtained from off Sydney. Ventral broken. Line shows the position of anus. Scale equals 5 mm.

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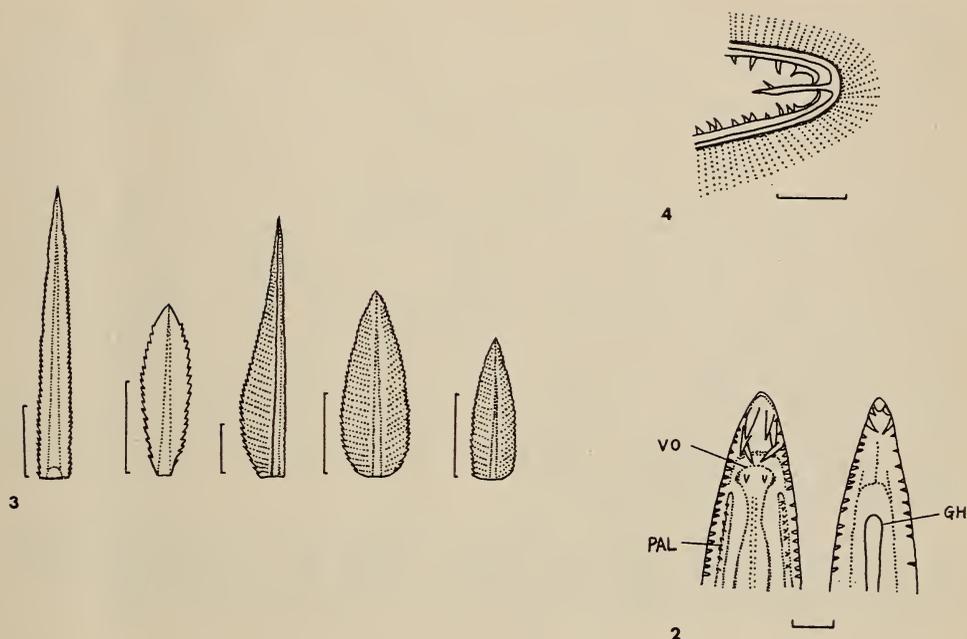


Fig. 2. Inside of upper (left) and lower (right) jaws of the juvenile. VO: vomer, PAL: palatine, GH: glossohyal. Scale equals 1 mm.

Fig. 3. Outer surface of first gill arch (left side) of the juvenile. Scale equals 1 mm.

Fig. 4. Spines in anterior view of the juvenile. From left to right: first dorsal spine, 20th dorsal spine, pelvic spine of left side, first anal spine and second anal spine. Each scale indicates 1 mm respectively.

anal spine 15.0 (5.4-14.2); length of longest anal ray (soft ray) 29.2 (24.5-35.4); caudal peduncle depth 14.3 (14.3-20.6).

Body elongate and compressed (Fig. 1). Greatest body width less than greatest body depth. Upper profile of head slightly convex from tip of snout to insertion of first dorsal fin (nearly straight in Lord How Island specimens). Snout less than twice as long as eye (slightly more than twice in larger specimens). Jaws bluntly conical; lower jaw projecting forward beyond tip of snout. Mouth large, maxillary scaleless, extending backward slightly beyond front edge of pupil. Three fangs on each side of upper jaw near tip of snout. A pair of canines near symphysis of lower jaw. A pair of minute teeth on vomer (vomer edentulous in larger specimens). A single series of small teeth on palatines (Fig. 2). Eye large, almost round. Infraorbital space very narrow, its least width less than diameter of pupil. Interorbital space narrower than eye. Lower part of preopercle armed with 2 spines. Several spines on hind part of opercle and subopercle (spines inconspicuous on hind part of opercle and subopercle in larger specimens). Lateral line single from near upper margin of opercle almost straight backward and

gradually downward from middle of first dorsal fin to base of caudal fin. Scales small, cycloid, imbricate in regular rows, but rather deciduous. Dorsal fin inserted above upper margin of opercle, base of first dorsal fin about three times as long as base of second dorsal fin. Soft rays of second dorsal fin preceded by a small spine, almost the same as soft rays of anal fin in shape and size. A flattened, dagger-shaped, serrated spine followed by a small, embedded, serrated spine between anus and insertion of soft anal (a dagger-shaped, smooth spine followed by a small, embedded, smooth spine in larger specimens). Soft rays of second anal fin inserted under third soft ray of second dorsal fin. Finlets 2 in dorsal and anal fins. Pectoral fin rather long, extending to vertical from base of seventh dorsal spine. Pelvic fin consists of a long flattened spine with serration followed by a soft ray (pelvic fin reduced to a small, single, smooth spine followed by a minute soft ray in larger specimens), inserted below origin of pectoral fin. All fin spines (20 first dorsal, 1 second dorsal, 1 pelvic and 2 anal) flattened and serrated more or less as shown in Fig. 3 (all fin spines smooth, elongated, dagger-shaped in larger specimens). Gill-raker at angle of first arch long, Y-shaped, other rakers short and acute (Fig. 4).

Colour of juvenile specimen fixed by formalin and preserved in ethanol, head and dorsal side of body dark brown; ventral side of body pale brown; pectoral fin dark brown; other fins pale brown. All fin membranes pale.

DISCUSSION

There have been few records of *Nealotus tripes* from waters around Australia. Some twenty specimens were recorded from Lord Howe Island (Ogilby, 1899; Allen *et al.*, 1976). Several specimens were recorded from off north western Australia (Parin and Bekker, 1972). There is no record from around New Zealand (Whitley, 1968), although four specimens were known from Kermadec Island (Waite, 1910). There is hitherto no record from around Papua-New Guinea (Munro, 1958b, 1967; Kailola, 1971, 1973, 1974). However, *Promethichthys prometheus* (Cuvier), recorded from Papua-New Guinea on the basis of two specimens by Munro (1958b) as species number 1128, represents two species. The Laughlan Island specimen (C.S.I.R.O. B.620) is *Nealotus tripes*, while the Collingwood Bay specimen (C.S.I.R.O. C.1616) is *Promethichthys prometheus*. The juvenile described here is a new record of *Nealotus tripes* to the waters of the east Australian continental shelf. This species is rather rare and distributed in chiefly circum-tropical and sub-tropical zones throughout the world.

The pelvic fin consists of a spine and a soft ray in both the juvenile fish and specimens from Lord Howe Island, although Matsubara and Iwai (1952) described the ventral reduced to a single smooth spine. The senior author re-examined the materials of Matsubara and Iwai deposited in Kyoto University and found that they missed a minute soft ray because of the bad condition of the materials. Strasburg (1964) gave a spine and 0.2 (mostly 2) soft rays as the pelvic fin elements in postlarval stages. The relative length of the pelvic spine (expressed as percent of standard length) decreases with growth (Fig. 5).

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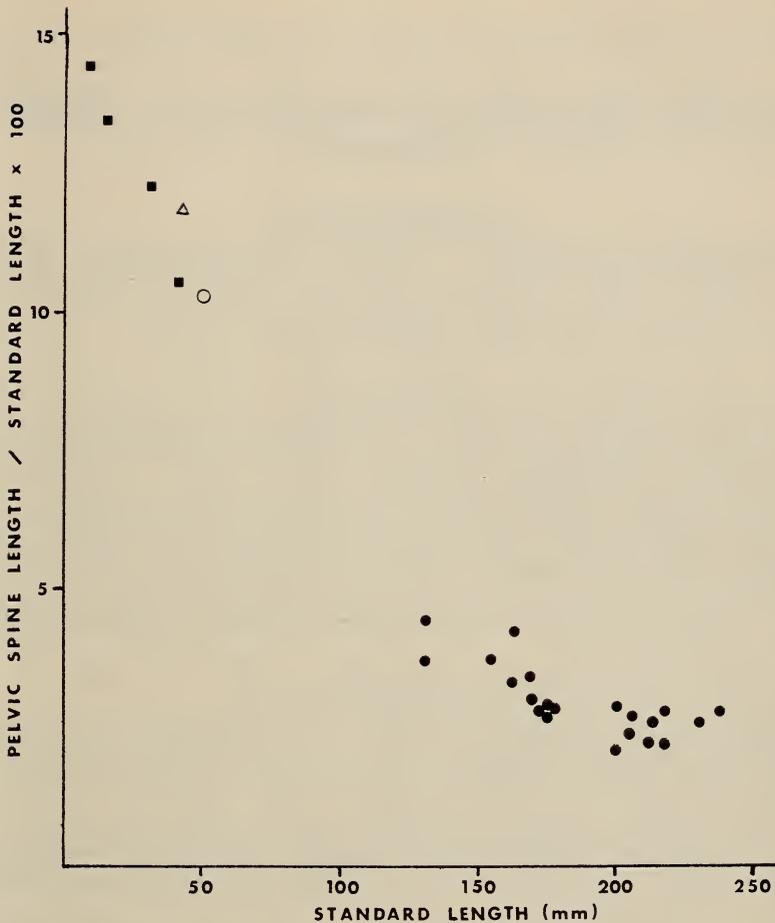


Fig. 5. Relative length of pelvic spine in *Nealotus tripes*. Pelvic spine lengths are plotted against the standard length. Squares: after Strasburg (1964); triangle: AMS IA.1424, from Lord Howe Island (smallest specimen of the Australian Museum collection); open circle: juvenile from off Sydney; closed circles: Lord Howe Island specimens.

The second anal spine is embedded along the ventral margin of the body, following the erected longer first anal spine in both juvenile and fishes from Lord Howe Island, although both the first and second anal spines are erected in Fig. 11 of Matsubara and Iwai (1952). The second embedded anal spine is thought to be one of the specific characteristics (adult phase) of *Nealotus tripes*. According to the figures shown by Strasburg (1964), both the first and second anal spines are erect in the postlarval stage.

Comparing our juvenile with a juvenile of *Nealotus tripes* (41.5 mm in standard length) described by Strasburg (1964) from southwest of Hawaii, both

are similar in external appearance. But they show some differences, such as head contour ("almost straight" of the former to "round" of the latter), spines on opercular and subopercular region (several spines on opercle and subopercle of the former to two opercular spines only of the latter) and the condition of the second anal spine (embedded of the former to erect of the latter).

ACKNOWLEDGEMENTS

We acknowledge with thanks the help of the captain and crew of F.R.V. Kapala of New South Wales State Fisheries for obtaining the juvenile specimen. We are very grateful to Roland J. McKay of the Queensland Museum and Ian S. R. Munro of C.S.I.R.O., Division of Fisheries and Oceanography, Cronulla for their permission to examine specimens deposited there. We wish also to thank Reiko K. Nakamura for her help.

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